

having a graphical user interface or a Web browser through which a user can interact with an implementation of the systems and techniques described here), or any combination of such back end, middleware, or front end components. The components of the system can be interconnected by any form or medium of digital data communication (e.g., a communication network). Examples of communication networks include a local area network ("LAN"), a wide area network ("WAN"), and the Internet.

The computing system can include clients and servers. A client and server are generally remote from each other and typically interact through a communication network. The relationship of client and server arises by virtue of computer programs running on the respective computers and having a client-server relationship to each other.

In some implementations, the computing devices depicted in FIG. 10 can include sensors that interface with a virtual reality (VR headset 1090). For example, one or more sensors included on a computing device 1050 or other computing device depicted in FIG. 10, can provide input to VR headset 1090 or in general, provide input to a VR space. The sensors can include, but are not limited to, a touchscreen, accelerometers, gyroscopes, pressure sensors, biometric sensors, temperature sensors, humidity sensors, and ambient light sensors. The computing device 1050 can use the sensors to determine an absolute position and/or a detected rotation of the computing device in the VR space that can then be used as input to the VR space. For example, the computing device 1050 may be incorporated into the VR space as a virtual object, such as a controller, a laser pointer, a keyboard, a weapon, etc. Positioning of the computing device/virtual object by the user when incorporated into the VR space can allow the user to position the computing device to view the virtual object in certain manners in the VR space. For example, if the virtual object represents a laser pointer, the user can manipulate the computing device as if it were an actual laser pointer. The user can move the computing device left and right, up and down, in a circle, etc., and use the device in a similar fashion to using a laser pointer.

In some implementations, one or more input devices included on, or connect to, the computing device 1050 can be used as input to the VR space. The input devices can include, but are not limited to, a touchscreen, a keyboard, one or more buttons, a trackpad, a touchpad, a pointing device, a mouse, a trackball, a joystick, a camera, a microphone, earphones or buds with input functionality, a gaming controller, or other connectable input device. A user interacting with an input device included on the computing device 1050 when the computing device is incorporated into the VR space can cause a particular action to occur in the VR space.

In some implementations, a touchscreen of the computing device 1050 can be rendered as a touchpad in VR space. A user can interact with the touchscreen of the computing device 1050. The interactions are rendered, in VR headset 1090 for example, as movements on the rendered touchpad in the VR space. The rendered movements can control objects in the VR space.

In some implementations, one or more output devices included on the computing device 1050 can provide output and/or feedback to a user of the VR headset 1090 in the VR space. The output and feedback can be visual, tactical, or audio. The output and/or feedback can include, but is not limited to, vibrations, turning on and off or blinking and/or flashing of one or more lights or strobes, sounding an alarm, playing a chime, playing a song, and playing of an audio file. The output devices can include, but are not limited to,

vibration motors, vibration coils, piezoelectric devices, electrostatic devices, light emitting diodes (LEDs), strobes, and speakers.

In some implementations, the computing device 1050 may appear as another object in a computer-generated, 3D environment. Interactions by the user with the computing device 1050 (e.g., rotating, shaking, touching a touchscreen, swiping a finger across a touch screen) can be interpreted as interactions with the object in the VR space. In the example of the laser pointer in a VR space, the computing device 1050 appears as a virtual laser pointer in the computer-generated, 3D environment. As the user manipulates the computing device 1050, the user in the VR space sees movement of the laser pointer. The user receives feedback from interactions with the computing device 1050 in the VR space on the computing device 1050 or on the VR headset 1090.

In some implementations, one or more input devices in addition to the computing device (e.g., a mouse, a keyboard) can be rendered in a computer-generated, 3D environment. The rendered input devices (e.g., the rendered mouse, the rendered keyboard) can be used as rendered in the VR space to control objects in the VR space.

Computing device 1000 is intended to represent various forms of digital computers, such as laptops, desktops, workstations, personal digital assistants, servers, blade servers, mainframes, and other appropriate computers. Computing device 1050 is intended to represent various forms of mobile devices, such as personal digital assistants, cellular telephones, smart phones, and other similar computing devices. The components shown here, their connections and relationships, and their functions, are meant to be exemplary only, and are not meant to limit implementations of the inventions described and/or claimed in this document.

A number of embodiments have been described. Nevertheless, it will be understood that various modifications may be made without departing from the spirit and scope of the specification.

In addition, the logic flows depicted in the figures do not require the particular order shown, or sequential order, to achieve desirable results. In addition, other steps may be provided, or steps may be eliminated, from the described flows, and other components may be added to, or removed from, the described systems. Accordingly, other embodiments are within the scope of the following claims.

What is claimed is:

1. A computer-implemented method comprising:

configuring, with a processor, a plurality of privacy properties for a plurality of virtual objects associated with a first user accessing a virtual reality environment using a device associated with the first user;

triggering for display, in the virtual reality environment, at least one of the plurality of virtual objects to the first user accessing the virtual reality environment;

in response to determining that at least one of a plurality of additional users accessing the virtual reality environment is attempting to access the at least one virtual object:

applying a visual modification to the at least one virtual object based at least in part on a privacy setting associated with the at least one virtual object, and triggering for display, in the virtual reality environment, the visual modification of the at least one virtual object to the at least one of the plurality of additional users while continuing to trigger display, to the first user, the at least one virtual object without the visual modification.